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## Original article

## Effects of probiotic and alpha-lipoic acid supplements, separately or in combination on the anthropometric indicators and maintenance of weight in overweight individuals



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## SUMMARY

**Background & aims:** Weight loss after proper diet is one of the main topics in nutrition. This study was designed to evaluate the effects of probiotic and alpha-Lipoic acid (ALA) supplements on the anthropometric indicators and maintenance of weight in overweight individuals.

**Methods:** This study consisted of two phases of weight loss (8 weeks) and weight maintenance (16 weeks). Eighty-eight overweight participants were randomly divided into 4 groups in phase 1: isocaloric diet with probiotic (500 mg), an isocaloric diet with ALA (600 mg) and probiotic, an isocaloric diet with ALA and isocaloric diet with placebo. In phase 2, participants received a normal diet with the mentioned supplements. In the beginning, end of the phase 1, and at the end of phase 2, weight, body mass index (BMI), waist circumference (WC), hip circumference (HC), body fat percentage, and blood pressure (BP) were measured. Also, 10 cc blood samples were taken from subjects to measure C-reactive protein (CRP). Data was analyzed using SPSS software.

**Results:** At the end of the two phases, the differences of changes in the probiotic + ALA group was significant in weight, WC, and CRP factors when compared to the other groups ( $P < 0.05$ ). Also, at the end of the study, maintain a reduced weight was significantly higher in the probiotic + ALA group than in the other groups ( $P < 0.05$ ).

**Conclusion:** According to findings, probiotics and ALA supplementation with normal diet help to maintain decreased weight after adhering to a weight loss diet. This may be due to the reduction of inflammation.

**Trial registration:** (IRCT20141025019669N10).

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**Abbreviations:** ALA, Alpha-Lipoic Acid; AMPK, Activated Protein Kinase; BMI, Body Mass Index; BP, Blood Pressure; CRP, C-reactive protein; DBP, Diastolic blood pressure; ESRD, End Stage of Renal Disease; HC, hip circumference; IPAQ, International Physical Activity Questionnaire; SBP, Systolic blood pressure; WC, waist circumference.

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## 1. Introduction

Obesity is a common problem that is mainly due to the function of genetic factors, increased calorie intake, and lack of physical activity, that the most common cause of these diseases is inflammatory reactions in the body due to a malfunctioning immune system [1]. Clinical studies of obesity and overweight have been associated with high blood pressure, diabetes, cardiovascular disease, and cancer, that the most common cause of these diseases is inflammatory reactions in the body due to a malfunctioning